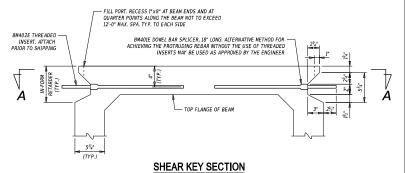


9" MIN. 3" MIN. CL. (TYP. TO € BEARING ALL SIDES 2½" DIA. DOWEL HOLE HOLE (TYP.)

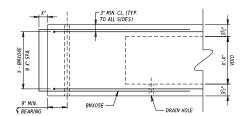


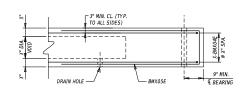
TYPICAL SLAB BEAM END PLAN

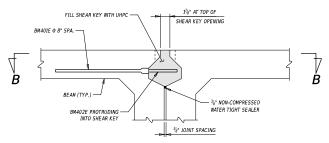
without protruding bars NOTE: EXAMPLE SHOWN USING 4'-0" WIDE BEAM WITH THREE 0'-8" CIRCULAR VOIDS. NOTE: BM401E AND BM402E BARS ARE SHOWN WITHIN THE SAME PLANE FOR THE PURPOSE OF THIS DETAIL ONLY. REFER TO TYPICAL ADJACENT BEAM PLAN DETAILS ON THIS SHEET FOR BAR SPACING. EXAMPLE SHOWN USING BOX BEAM.

TYPICAL BOX BEAM END PLAN

with protruding bars NOTE: EXAMPLE SHOWN USING 4'-0" WIDE BEAM. * REFER TO 'BOX BEAM STRAND CONFIGURATION' ON SHEET 1 FOR MORE INFORMATION.







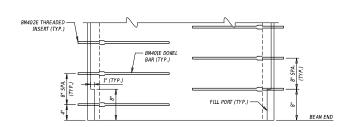
TYPICAL BOX BEAM END ELEVATION

with protruding bars NOTE: PROTRUDING BAR USED IN DIAPHRAM AND/OR DECK OVERPOUR.

TYPICAL SLAB BEAM END ELEVATION

without protruding bars NOTE: EXAMPLE SHOWN USING VOIDED SLAB BEAM.

SHEAR KEY DETAIL NOTE: EXAMPLE SHOWN USING BOX BEAM.



17/8" AT TOP OF SHEAR KEY OPENING FILL SHEAR KEY WITH UHPC 3/4 IOINT SPA BAR (TYP.) BM402F THREADED BEAM END 378" TOP OF BEAM AT FILL PORT

SHEAR KEY NOTES

- TO CREATE AN EXPOSED AGGREGATE SURFACE WITHIN THE SHEAR KEY, APPLY AN IN-FORM RETARDER FROM THE TOP OF BEAM TO BOTTOM OF THE SHEAR KEY ALONG THE FULL LENGTH OF BEAM ON BOTH SIDES. DO NOT ALLOW STAINS FROM OIL, GREASE OR OTHER CONTAMINATES TO BE PRESENT WITHIN THE SHEAR KEY, OMIT THE SHEAR KEY DETAIL, IN-FORM RETARDER, AND BM401E AND BM402E BARS ON THE EXTERIOR FACE OF THE FASCIA
- NEAUS.
 INSTALL THE MOVE BASE PRIOR TO DELIVERING BEAMS TO THE CONSTRUCTION SITE. AN AUTERNATIVE METHOD
 TO THREADED BH402E BAR PROTRUDING INTO THE SHEAR KEY SPACE MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

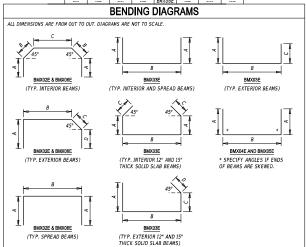
 STAGGER THE BM401E AND BM402E BARS ACCORDING TO THE DETAILS PROVIDED ON THIS SHEET TO FORM A
- NON-CONTACT LAP SPLICE ALONG THE LENGTH OF THE SHEAR KEY.

 TO CREATE A FILL PORT, RECESS THE SHEAR KEY I" x 8", PLACE THE FILL PORTS AT BEAM ENDS AND AT A
 SPACING EQUAL TO THE LESSER OF QUARTER POINTS ALONG THE BEAM OR 12"-0".
- VALUE ENGINEERING PROPOSALS ELIMINATING THE USE OF UHPC WILL NOT BE CONSIDERED.

TYPICAL ADJACENT BEAM PLAN (SECTION A-A)

TYPICAL ADJACENT BEAM JOINT PLAN (SECTION B-B)

REINFORCING BAR LIST													
S	TRAIG	HT BAR	5	BENT BARS									
MARK	SIZE	QTY.	LENGTH	MARK	SIZE	QTY.	LENGTH						
BM401E	4		1'-6"	BMX02E	-								
BM402E	4		51/2*	ВМХ03Е	-								
BMX01E				BMX04E	-								
				BMX05E	-								
				DMYOSE									



DESIGNER NOTES

- 1. REFER TO SECTION 106.9 FOR MORE INFORMATION ON THE DESIGN AND DETAILING OF PRESTRESSED CONCRETE BOX AND SLAB BEAMS, ALSO REFER TO SECTION 103.4.1.2 FOR MORE INFORMATION ON WHEN USE OF BOX OR SLAB BEAM IS APPROPRIATE.
- 2. FOR MORE INFORMATION ON ALLOWABLE PRESTRESSING STRAND TYPE AND SIZES, REFER TO SECTION 205.4.4.
- 3. REINFORCEMENT FOR BARRIERS TO BE CAST WITH PRESTRESSED CONCRETE BOX AND SLAB BEAMS NOT SHOWN FOR CLARITY. REFER TO DETAIL NO. 325.02 'BRIDGE RAILING DETAILS' FOR MORE INFORMATION
- 4. THE PRESTRESSED CONCRETE BOX AND SLAB BEAM SECTIONS AND STRAND CONFIGURATION AS SHOWN IN THESE DETAILS ARE RECOMMENDED. IF THE DESIGNER IS CONSIDERING USING DIFFERENT STRAND PATTERNS OR CREATING NON-SYMMETRICAL SECTIONS, NOTE THAT THE FABRICATION COSTS WILL LIKELY INCREASE SIGNIFICANTLY.
- 5. THE DEPARTMENT PREFERS THE USE OF ULTRA HIGH PERFORMANCE CONCRETE (UHPC) TO CONNECT ADJACENT BEAMS. THE DETAILS PROVIDED HEREIN DEPICT TYPICAL DETAILS FOR UHPC SHEAR KEY CONNECTIONS DEVELOPED AND TESTED BY FHWA. APPROVAL MUST BE OBTAINED FROM THE BRIDGE DESIGN ENGINEER TO UTILIZE AN ALTERNATIVE METHOD OF CONNECTING ADJACENT BEAMS.
- 6. THE DETAILS SHOWN ASSUME THAT 5" THICK CONCRETE DECK ON ADJACENT BEAMS WILL BE USED. HOWEVER, IN CONJUNCTION WITH UHPC SHEAR KEY CONNECTIONS, A C.I.P. DECK MAY NOT BE NECESSARY AND IS NOT PREFERRED. INSTEAD THE DESIGNER SHOULD CONSIDER AN OVERLAY, BITUMINOUS CONCRETE MERCHANG SURFACE, OR ALLOWING THE TOP FLANGE TO BECOME THE RIDING SURFACE. THE DESIGNER IS RESPONSIBLE FOR MODIFYING THE DETAILS HERRING AS NECESSARY IN STREAM OF THE STREAM OF THE RIDING SURFACE.
- 7. THE DESIGNER SHOULD NOTE ON THE PLANS THE TOTAL NUMBER OF INTERIOR AND EXTERIOR BEAMS NEEDED FOR THE PROJECT AND THE ESTIMATED WEIGHT OF THE BEAMS.
- 8. DETAILS FOR STAY-IN-PLACE FORMS, DECK SLAB DETAIL AT PIER, AND DECK SLAB POUROVER AT ABUTMENT CAN BE FOUND IN DETAIL NO. 325.01 CONCRETE DECK DETAILS.
- 9. ENSURE WORKING DRAWINGS MEET ALL REQUIREMENTS AS OUTLINED IN SECTION 612.03(B)&(E) OF THE DELDOT STANDARD SPECIFICATIONS.
- 10. THIS DETAIL DOES NOT SHOW POTENTIAL PRESTRESSING STRANDS EXTENDING INTO PIER DIAPHRAGM OR DECK SLAB POUROVER FOR CLARITY. IF REQUIRED PER DESIGN, REFER TO AS.12.3.3.9 FOR MORE INFORMATION ON DESIGN AND DETAILING FOR EXTENDING OF PRESTRESSING STRANDS INTO PIER DIAPHRAGM OR DECK SLAB POUROVER.
- 11. THE DESIGNER MUST CONSIDER THE DIFFERENCES IN DECK THICKNESS BETWEEN CENTERLINE OF BEARINGS AND POINT OF MINIMUM THICKNESS ALONG THE BEAM DUE TO THE DIFFERENCE IN THE PROFILE TO CAMBERED SHAPE OF THE PRESTRESSED CONCRETE ADJACENT BOX AND SLAB BEAMS. THE FINAL GRADES AND SUBSTRUCTURE ELEVATIONS MUST BE ADJUSTED ACCORDINGLY.
- 12. WHEN DEVELOPING THE UHPC SHEAR KEY DETAILS, FHWA SUCCESSFULLY TESTED BOX BEAMS WITH 5 \(\frac{1}{2} \) THICK WALLS. DELDOT HAS INCREASED THE PREFERRED BOX BEAM WALL THICKNESS TO 5 \(\frac{1}{2} \) TO SALOW FOR GREATER COVER OF REINFORCEMENT. IF THE DESIGNER PROPOSES TO USE 5 \(\frac{1}{2} \) THICK WALLS WITH UHPC SHEAR KEY DETAILS, THE DESIGNER MUST VERIFY THE REINFORCEMENT CLEARANCE.
- 13. THE DESIGNER MUST EVALUATE THE NEED FOR INTERNAL DIAPHRAGM(S) IN BOX BEAMS OR VOIDED SLABS FOR STABILITY DURING TRANSPORTATION.

NOTE: ALL REINFORCEMENT FOR THE BOX or SLAB BEAM IS INCLUDED IN ITEM (insert appropriate beam item number). THE REINFORCING BAR LIST AND BENDING DIAGRAMS MUST BE SHOWN ON THE BOX or SLAB BEAM SHEETS AND BE SEPARATE FROM THE BRIDGE REINFORCEMENT BAR SHEET.

NOTE: THE DIMENSIONS ON THIS SHEET ARE RECOMMENDED. THE DESIGNER IS STILL RESPONSIBLE FOR ENSURING THAT THE DIMENSIONS SHOWN ON PLANS ARE ACCURATE AND PROJECT-SPECIFIC, DIMENSIONS FOR BMX06E ARE BASED ON 5' THICK CONCRETE DECK. REDUCE 'A' DIMENSION FOR BMX06E AS NECESSARY TO REDUCE CONCESTION IF MULTIPLE ROWS OF STRANDS WILL BE USED. IF PREFERRED, BMX06E BASS MAY BE COMBINED INTO ONE CONTINUOUS BAR BEND.

			DEPTH OF BOX BEAM												DEPTH OF SLAB BEAM											\neg									
MARK	WIDTH	LETTER	21°(1)	21"(E)	21°(S)	24"(1)	24"(E)	24*(S)	27°(1)	27"(E)	27"(5)	33*(I)	33"(E)	33*(S)	39"(1)	39"(E)	39°(S)	42°(1)	42*(E)	42"(S)	MARK	WIDTH	LETTER	12*(I)	12"(E)	12°(S)	15°(1)	15"(E)	15*(S)	18*(1)	18"(E)	18*(S)	21°(1)	21°(E)	21"(5)
		Α	0'-11"	1'-5"	1'-5"	1'-2"	1'-8"	1'-8"	1'-5"	1'-11"	1'-11"	1'-11"	2'-5"	2'-5"	2'-5"	2'-11"	2'-11"	2'-8"	3'-2"	3'-2"			A	0'-21/2"	0'-8"	0'-8"	0'-512"	0'-11"	0'-11"	0'-8"	1'-2"	1'-2"	0'-11"	1'-5"	1'-5"
	36"	В	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"	0'-8"	2'-2*	2'-8"	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"		36"	В	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"	0'-8"	2'-2"	2'-8"
	30	С	1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-81/2"	0'-8"	****		30	С	1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-81/2"	0'-8"		1'-812"	0'-8"	
BMX02E		D		0'-11"		****	1'-2"			1'-5"		****	1'-11"			2'-5"		****	2'-8"	****	BMX02E		D		0'-21/2"			0'-51/2"			0'-8*			0'-11"	
DMAUZE		Α	0'-11"	1'-5"	1'-5"	1'-2"	1'-8"	1'-8"	1'-5"	1'-11"	1'-11"	1'-11"	2'-5"	2'-5"	2'-5"	2'-11"	2'-11"	2'-8"	3'-2"	3'-2"	DMAUZE		A	0'-21/2"	0'-8"	0'-8"	0'-512"	0'-11"	0'-11"	0'-8"	1'-2"	1'-2"	0'-11"	1'-5"	1'-5"
	48"	В	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"	0'-8"	3'-2*	3'-8"	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"		48"	В	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"	0'-8"	3'-2"	3'-8"
	40	С	2'-81/2"	0'-8"		2"-81/2"	0'-8"		2'-81/2"	0'-8"		2"-81/2"	0'-8"		2'-81/2"	0'-8"		2'-81/2"	0'-8"			40	С	2'-81/2"	0'-8"		2"-81/2"	0'-8"		2'-81/2"	0'-8"		2'-81/2"	0'-8"	
		D		0'-11"		****	1'-2"	****		1'-5"		****	1'-11"	****		2'-5"		***	2'-8"	****			D	****	0'-21/2"			0'-51/2"		****	0'-8"			0'-11"	
		Α	0'-11"	1'-5*	1'-5"	1'-2"	1'-8"	1'-8"	1'-5"	1'-11"	1'-11*	1'-11"	2'-5*	2'-5"	2'-5"	2'-11"	2'-11*	2'-8"	3'-2"	3'-2"		$\neg \neg$	A	0'-21/2"	0'-8"	0'-8"	0'-51/2"	0'-11"	0'-11"	0'-8"	1'-2"	1'-2"	0'-11"	1'-5"	1'-5"
	36"	В	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"		36"	В	2'-8"	2'-8"	2"-8"	2'-8"	2'-8"	2'-8"	2'-8"	2'-8"	2"-8"	2'-8"	2'-8"	2'-8"
	30	С		0'-11"		****	1'-2"			1'-5"		****	1'-11"	***		2'-5"		-	2'-8"	***		30	С	0'-8"	0'-21/2"		0'-8"	0'-51/2"		****	0'-8"			0'-11"	
ВМХОЗЕ		D				****		****				****		****						****	вмхозе		D		0'-8"			0'-8"		****			_		
DMAUSE		Α	0'-11"	1'-5"	1'-5"	1'-2"	1'-8"	1'-8"	1'-5"	1'-11"	1'-11*	1'-11"	2'-5*	2'-5"	2'-5"	2'-11"	2'-11*	2'-8"	3'-2"	3'-2"			A	0'-21/2"	0'-8"	0'-8"	0'-512"	0'-11"	0'-11"	0'-8"	1'-2"	1'-2"	0'-11"	1'-5"	1'-5"
	48"	В	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"		48"	В	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"	3'-8"
	40	С		0'-11"		****	1'-2"			1'-5"		****	1'-11"			2'-5"			2'-8"	***			С	0'-8"	0'-21/2"		0'-8"	0'-51/2"			0'-8"			0'-11"	
		D				****		****				****		****						****			D	****	0'-8"			0'-8"							
	36"	Α	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"		36"	A	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"
BMX04E	3	В	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	BMX04E	3	В	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2'-6"	2"-6"	2'-6"	2'-6"	2'-6"
DIANOAL	48"	Α	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	DMAU4E	48"	A	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"
	Ŧ	В	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"		40	В	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"	3'-6"
	36"	Α	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"		36"	A	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"
BMX05E	50	В	1'-3"	1'-3"	1'-3"	1'-6"	1'-6"	1'-6"	1'-9"	1'-9"	1'-9"	2'-3"	2'-3"	2'-3"	2'-9"	2'-9"	2'-9"	3'-0"	3'-0"	3'-0"	BMX05E	50	В	0'-6"	0'-6"	0'-6"	0'-9"	0'-9"	0'-9"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"
Divinose	48"	Α	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"	5'-9"	DMXOSE	48"	A	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9"	5'-9*	5'-9"
		В	1'-3"	1'-3"	1'-3"	1'-6"	1'-6"	1'-6"	1'-9"	1'-9"	1'-9"	2'-3"	2'-3"	2'-3"	2'-9"	2'-9"	2'-9"	3'-0"	3'-0"	3'-0"		,,,	В	0'-6"	0'-6"	0'-6"	0'-9"	0'-9"	0'-9"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"
		Α	0'-11"	1'-91/2"	1'-91/2"	1'-2"	2'-01/2"	2'-0'2"	1'-5"	2'-31/2"	2'-31/2"	I'-11"	2'-91/2"	2'-91/2"	2'-5"	3'-31/2"	3'-31/2"	2'-8"	3'-61/2"	3'-61/2"			A	0'-21/2"	1'-01/2"	1'-01/2"	0'-51/2"	1'-31/2"	1'-31/2"	0'-8"	1'-61/2"	1'-61/2"	0'-11"	1"-912"	1'-91/2"
	36"	В	1'-2"	1'-91/2"	2'-8"	1'-2"	1'-91/2"	2'-8"	1'-2"	1'-91/2"	2'-8"	1'-2*	1'-9½"	2'-8"	1'-2"	1'-91/2"	2'-8"	1'-2*	1'-9½"	2'-8"		36"	В	1'-2"	1'-9½"	2'-8"	1'-2"	1'-91/2"	2'-8"	1'-2"	1'-9½"	2'-8"	1'-2"	1'-91/2"	2'-8"
	30	С	1'-0"	1'-2"		1'-0"	1'-2"		1'-0"	I'-2*		1'-0"	1'-2"		1'-0"	I'-2"		1'-0"	1'-2"			30	С	1'-0"	1'-2"		1'-0"	1'-2"		1'-0"	1'-2"		1'-0"	I'-2"	
BMX06E		D		0'-11"			1'-2"			1'-5"			1'-11"			2'-5"			2'-8"		8" -	48"	D		0'-212"			0'-51/2"			0'-8"			0'-11"	
DAUUL		Α	0'-11"	1'-91/2"	1'-9½"	1'-2"	2'-01/2"	2'-0'2"	1'-5"	2'-31/2"	2'-31/2"	1'-11"	2'-91/2"	2'-912"	2'-5"	3'-3½"	3'-31/2"	2'-8"	3'-61/2"	3'-61/2"			A	0'-21/2"	1'-0½"	1'-01/2"	0'-5\2"	1'-312"	1'-3½"	0'-8"	1'-61/2"	1'-61/2"	0'-11"	1'-912"	1'-91/2"
1	48"	В	1'-2"	2'-912"	3'-8"	1'-2"	2'-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"	I'-2*	2'-9½"	3'-8"			В	1'-2"	2"-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"	1'-2"	2'-91/2"	3'-8"
1		С	2'-0"	1'-2*		2'-0"	1'-2"		2'-0"	1'-2*		2'-0"	1'-2"		2'-0"	1'-2"		2'-0"	1'-2"				C	2'-0"	1'-2"		2'-0"	1'-2*		2'-0"	1'-2"		2'-0"	1'-2"	
I		D		0'-11"			1'-2"			1'-5"			1'-11"			2'-5"			2'-8"				D		0'-212"			0'-51/2"			0'-8*		1 -7	0'-11"	

NOTE: (1) DENOTES INTERIOR BEAMS (E) DENOTES EXTERIOR BEAMS (S) DENOTES SPREAD BEAMS